

Currituck Sound Ecosystem Restoration Feasibility Study

Public Meetings

28 and 29 September 2010

U.S. Army Corps of Engineers
Wilmington District

And

NC Department of Environment and
Natural Resources



US Army Corps of Engineers
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Wilmington
District



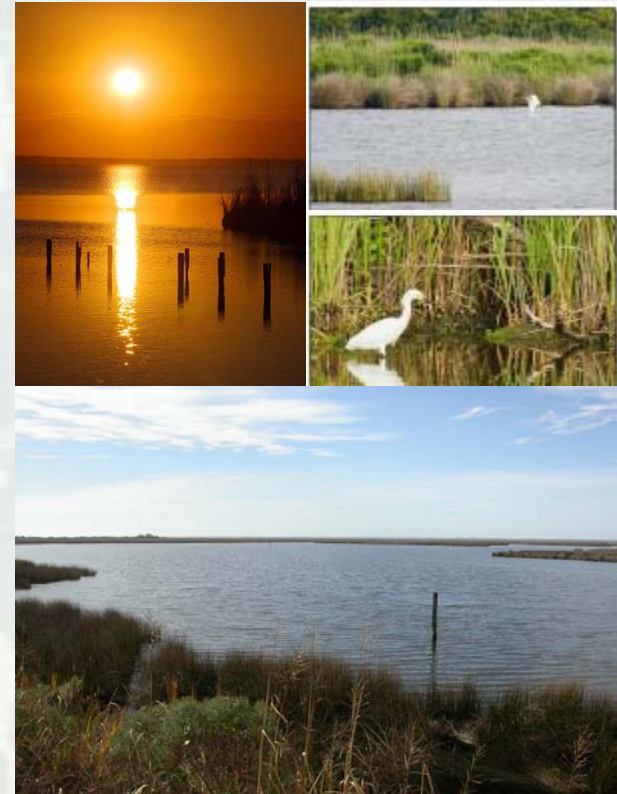
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INTRODUCTIONS

- **US Army Corps of Engineers - Wilmington District**
 - Project Manager: Pam Castens
 - Lead Planner: Doug Piatkowski
 - Deputy District Engineer: Christine Brayman
 - Study Team Members:
- **North Carolina Department of Environment and Natural Resources (NCDENR) – Non-Federal Sponsor**
 - Director: Tom Reeder
- **Currituck County Representatives**



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MEETING GOALS

1. Communicate study status and future direction to stakeholders and the Public
2. Solicit feedback from stakeholders and the Public on identified ecosystem Problems and Opportunities, Existing and Future without Project Conditions, Planning Objectives and potential Measures to address restoration issues.



STUDY BACKGROUND

- **Study Sponsor:** This study is cooperatively conducted by the USACE Wilmington District and the non-federal sponsor, North Carolina Department of Environment and Natural Resources (NCDENR).
 - Cost Share: 50/50
- **Study Purpose:** To investigate and recommend appropriate federal actions and plans for ecosystem restoration initiatives in Currituck Sound, North Carolina.
- **Feasibility Study:** Initiated in February 2004.
- **Problem Identification:**
 - *Data compilation, collection, analysis, etc.*
 - Collaborative inter-agency effort
 - *Hydro-dynamic and Water Quality model Development*



PROBLEMS

- Currituck Sound has experienced a **significant change in ecosystem/habitat function** with wide fluctuations in water salinity and the type and quantity of SAV, changes in fish population composition, and changes in resident and winter waterfowl habitat.
- **Water quality has declined** over the past 50 years primarily due to an increase in turbidity and possibly nutrient loading from nonpoint source runoff.
- **SAV**, including exotic Eurasian watermilfoil, have **significantly declined** since the 1980s thereby reducing spawning habitat and/or nursery habitat for a species. Changes associated with declines in coverage and type of SAV has reduced a primary food source for wintering waterfowl.
- **Some fish species** (primarily largemouth bass and other sunfish) **and wintering waterfowl populations** have declined drastically due to the loss of SAV and increased salinity (proving toxic to young sunfish).
- **Loss of waterbird nesting habitat** (i.e. Monkey Island).
- **Coastal marshes** and Currituck Sound waters have been **lost to erosion** or **invaded by exotic plant and animal species**.
- **Public perception** of ecosystem change and function within Currituck Sound relative to human use activities.



CONCEPT MODEL

- **Conceptual models** are descriptions of the general functional relationships among essential components of an ecosystem. They tell the story of “how the system works” and, in the case of ecosystem restoration, how restoration actions aim to alter those processes or attributes for the betterment of the system
- **General approach:** Identify significant ecological resources occurring in the basin, the primary state conditions governing these resources, and the drivers and stressors leading to these state conditions.

Drivers

Fetch

Land Use

Boating

Dredging

Hydrologic Connectivity

Agricultural, Urban, Shore and Bank Protection

Canals, Entrainment, Propeller Damage

Disposal Sites, Schedule

Inlets, Island Overwash, Inland Flooding, Movement Barriers

Physio-Chemical Processes Affected

Direct Habitat Conversion

Suspended Sediment (Turbidity)

Hydrodynamics (Velocity, Depth, Wave Energy)

Nutrients (Nitrogen, Phosphorous)

Principal State Variables

Salinity

Light

Substrate

Elevation

Invasive Plants

Biological Processes

Reproduction

Survival

Colonization

Significant Resources

Fisheries

Waterbirds

Waterfowl

Other Animals

Vegetation

Migratory, Estuarine Nursery, Estuarine Resident

Tree-Nesting, Sand-Nesting

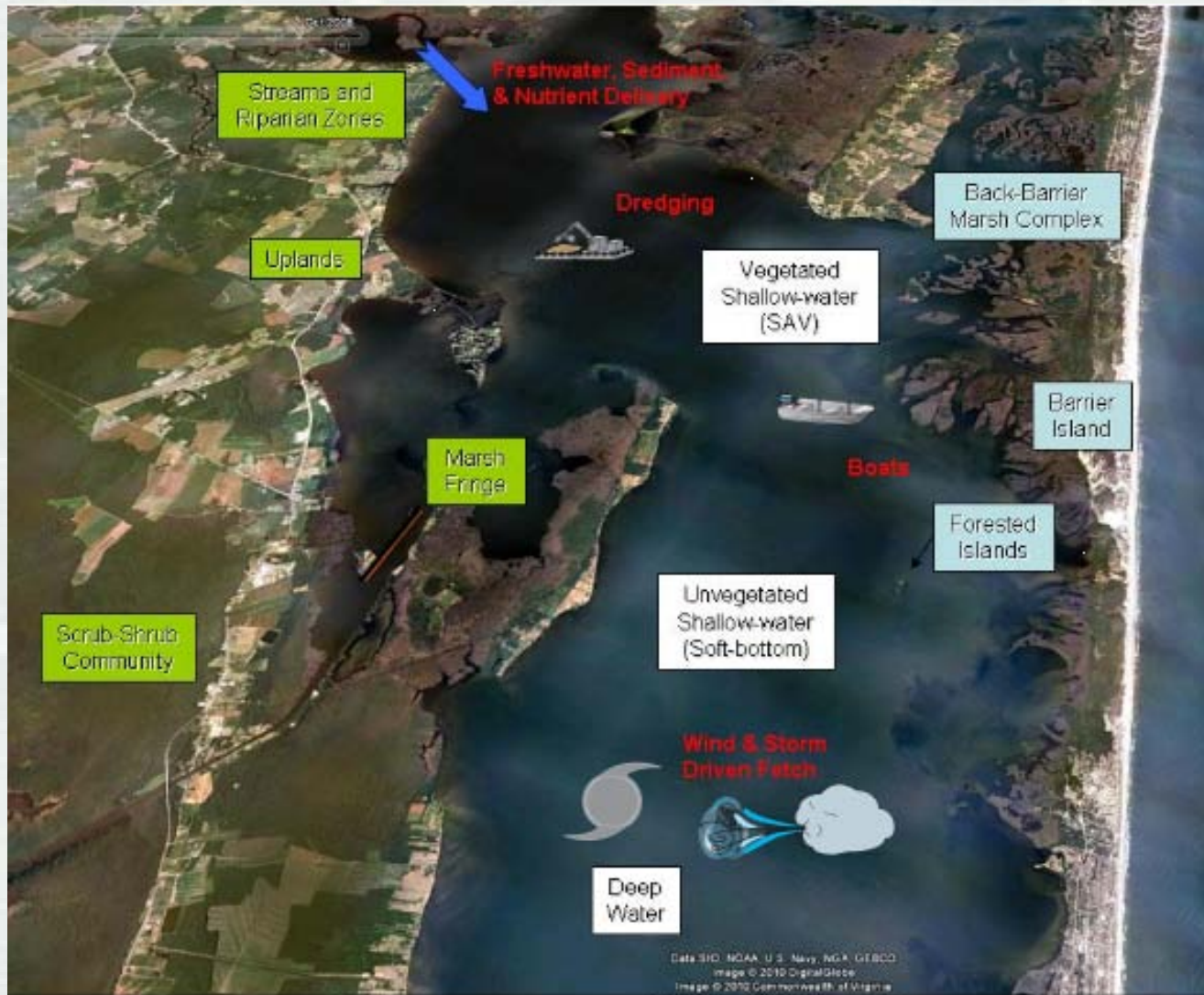
Migratory, Resident

Crustaceans, Turtles, Mammals

Submerged Aquatic Vegetation, Back-Barrier Marsh, Marine Forest



CONCEPT MODEL



GOALS AND OBJECTIVES

- **Goal 1:** “*Restore significant ecosystem structure, function, and dynamic processes by providing a mosaic of interconnected ecosystem types contributing to a resilient estuarine system supporting a diverse faunal assemblage*”

- **Objective 1.1:** *HABITAT*: provide habitat for a diverse assemblage of floral and faunal taxa.

- Increase the extent of **vegetated shallow water ecosystems**
- Increase the extent of **back barrier estuarine marsh**
- Increase the extent of **nesting island ecosystems**
- Promote **mainland and streamside ecosystems** to the extent that they support vegetated shallow bottom, back barrier marsh, and island ecosystems

- **Objective 1.2:** *CONNECTIVITY*: Promote connectivity of diverse ecosystem types

- **Objective 1.3:** *SUSTAINABILITY*: Promote sustainability of restored ecosystems.

- **Goal 2:** “Protect existing economic, social, and cultural resources.”

- **Goal 3:** “Implement a collaborative, comprehensive, and system-wide study.”



POTENTIAL MEASURES

- **Marsh Islands**

- Reclamations of lost acreages
- Protecting shorelines
- Planting of nesting trees

- **Back barrier Marsh**

- New marsh islands
- Low protective sill and marsh planting
- Thin layer of disposal of course material
- Phragmites control

- **Submerged Aquatic Vegetation**

- Protection of SAV beds
- Planting and seeding of SAV

- **Upland riparian**

- Riparian buffers
- Other Best Management Practices (BMP's)

- **Mainland Marsh**

- New marsh islands
- Low protective sill and marsh planting
- Phragmites control

- **Navigation/Beneficial Uses of Dredge Material**

- Operational changes to boating or dredging conditions
- Establishment of new and/or maintenance of existing confined dredged material disposal sites.
- Establishment of no wake zones in high erosion areas
- Marsh island restoration

- **Public Education and Communication**

- Establish avenues for public education pertaining to the unique nature of the Currituck Sound ecosystem



STUDY AREA “FLYOVER”



NEXT STEPS

- **Existing and FWOP Conditions Analysis** – Historic, existing, and future conditions.
- **Refinement of Management Measures** – Quantified and Site Specific
- **Forecasting Ecological Outcomes** – Ecological Model Development
- **Alternative Plan Formulation** – Combinations of identified measures
- **Evaluation of Alternatives** – Quantifying environmental benefits
- **Comparison and Selection of Alternative Plans**



COMMENTS

- All comments received will be considered as a part of the plan formulation process for this study. If you have any questions please contact Mr. Doug Piatkowski, at (910) 431-9684.

- **Submit Comments To:**

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- **Currituck Sound Study Website:**

- <http://www.saw.usace.army.mil/Currituck/index.htm>

